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## (54) COUPLINGS

(71) We, SPENCE ENGINEERING LIMITED of 67 Tullymore Road, Drumlough, Hillsborough, County Down, Northern Ireland, a Northern Ireland Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

5 This invention relates to the hitching of implements to traction units, for example excavator loaders, of the type having a wheeled or crawler chassis carrying a prime mover, a position defined on said chassis from which a driver can manipulate controls to operate the prime mover, and any moving parts provided on said unit and operable by remote control from said position, and at least two transversely spaced outward-reaching arms extending forwardly of said position and adapted to mount, at their outer ends, an implement such as a digging shovel. Each arm has, as its outer end, two vertically spaced members which are connectible to correspondingly spaced mountings on the implement, the arms being operable by hydraulic ram means to lift the implement relative to the unit and to incline it about one of its connections. Such traction units are expensive to purchase and, if possible, are adapted to perform as many tasks as possible, and for this purpose a series of implements to suit different tasks have been developed for hitching, one at a time, to the arms. While the operation of unhitching these implements from the arms is relatively straightforward, the operation of hitching the implements is time-consuming since it is necessary to connect each implement at four places, namely to the outer ends of the two members of each of the two arms. Each member is separate, at least at its outer end, from the other three members and there is a problem in the alignment of the outer ends of the members with their corresponding

10 mountings on the implement to enable the members and implement to be secured together.

15 According to the present invention, there is provided a hitching device for use in pairs, each for connection to an arm of a traction unit of the type stated, each of said devices comprising an elongate support mountable on end and from each opposite face of which first and second mounting means respectively extend, the first mounting means having two mountings spaced longitudinally of the support and adapted for connection to the outer ends of the two members on the arm of the traction unit, and the second mounting means having two catches spaced longitudinally of the support and for connection with mountings provided on an implement, a first catch for each device being located uppermost when the support is on end relative to the second catch and is formed by a hook having its entry opening upwardly in said position, and the second catch is formed by a block having an open-ended slot having its entry facing forwardly, the slot being closable by locking bolt slidably engaged in said block and acting downwardly to close off the entry to said slot.

20 Preferably, two hitching devices are braced together to form a hitching apparatus.

25 Preferably also the block is of U-shape fixed through its web to the support with one limb above the other and the slot defined therebetween, the upper limb having at its outer end an upward extension parallel to the support and through which extension and longitudinally thereof a bore is provided in which the locking bolt slides.

30 Preferably also, the bore is continued beyond the open-end of the slot partially into the lower limb to form a keeper for the bolt.

35 Preferably also, the bolt is moved into and out of a closable position by means of a handle-operated cranked lever.

40 Preferably further, the handle is remova-

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ble and the bolt is spring-biased to a closed position in the keeper, the handle being used to operate the bolt to open the slot.

Preferably further a pin is provided for 5 locating into two aligned holes provided in the first mounting means to hold said bolt open against its biasing.

Embodiments of the present invention will 10 now be described, by way of example, with reference to the accompanying drawings, in which:—

FIG. 1 is a side elevation of a hitching device according to the present invention;

FIG. 2 is a front elevation of a hitching apparatus according to the invention; and

FIG. 3 is a rear elevation of the hitching device.

In a first embodiment, referring to Fig. 1, the hitching device comprises an elongate support 10 formed by a rectangular plate upstanding in use i.e. on end, and from each major opposite face of which first and second mounting means respectively extend. The first mounting means comprises two rearwardly-directed parallel webs 11 extending from, and along the length of, each longer side of the support 10. The webs 11 have therethrough near their upper and lower ends similar transversely-aligned holes 12 centred about parallel axes normal to the webs 11 and in continuity with the bores of collars 13 bonded with the webs 11 to project inwardly and outwardly therefrom at the upper and lower ends, respectively, of the section. The second mounting means is two catches spaced longitudinally of the support 10, one above the other, the first and upper catch consisting of a hook 14 having its entry opening upwardly, and the second and lower catch consisting of a block 15 (omitted from one of the hitching devices shown in Fig. 2) of U-shape fixed through its web to the support 10 with one limb above the other and the slot 16 defined between the limbs facing outwardly and closable by a locking bolt 17. The upper limb 15A of the block 15 has at its outer end an upward extension 18 parallel to the support 10, a bore 19 being provided therethrough about its longitudinal axis, and being continued beyond the open-end of the slot 16, partially into the lower limb 15B to form a keeper 19A. The bolt 17 is in sliding engagement in said bore 19 with the outer and lower end of the bolt 17 seating in the keeper part 19A of the bore 19 in the lower limb 15B when the bolt 17 is in a closed position. The inner and upper end of the bolt 17 is connected through a linkage 20, which is a longitudinal extension of said bolt 19 and fixed at right angles to the outer end of a cranked lever 21. The other end of the lever 21 is fashioned as a handle 22. The lever 21 is pivoted at its crook, the pivot pin 23 of which is mounted to one web 11 of the first mounting means, and the handle 22 extends

beyond said first mounting means from said support 10. The two catches 14 and 15 extend from along the longitudinal mid-way line of the support 10.

In use, hitching devices are used in pairs and in the first embodiment, the two devices are braced together in spaced relationship by two ties 24 (Fig. 2) spaced one above the other, the hooks 14 and blocks 15 of both devices being bilaterally symmetrical.

In use, the outer ends of the two arms of a traction unit of the type stated are connected to the first mounting means, tapped bosses or aligned holes in said outer ends being aligned with the holes 12 of said first mounting means and being pinned together by a headed pin located therein and a securing pin or other means being passed through a diametrical hole in said pin at its outer end and on the other side of said connection from the head. The apparatus is left on the arms of the traction unit of the type stated. Each implement to be used has two spaced apart mounting means similar to the first mounting means of each device and prior to use, a pin is secured in each mounting. To hitch an implement, the levers 21 are moved so that the slots 16 are open-ended and the traction unit of the type stated is driven up to the implement, the apparatus inclined for the entry of the hooks 14 to be below the pins in the top mountings of the implement, the apparatus lifted so that the pins engage in the hooks 14 and on further upward movement, the implement is lifted off the surface on which it rests and swings, under gravitational forces, relative to the pivot, formed by the pins on the hooks 14, so that the pins of the second mountings enter the slots 16 and are held there under gravity. The levers 21 are moved for the bolts 17 to close the slots 16. Although the pins of the second mountings are held in position under gravity, the bolts 17 are provided to secure said pins thereon.

In a second embodiment, the hitching devices are separate and each is mounted on an arm of a traction unit of the type stated, as described in the first embodiment.

In a modification, not shown, the first mounting means may comprise two mountings spaced longitudinally of the support one above the other and each formed of an element having a pin-engageable hole or bore.

In a further modification (not shown), the bolt 17 is spring-loaded for engagement in the keeper 19A, and the linkage 20 is connected to a lever which projects through an upright slot in the support 10. A removable handle is provided to engage the outer end of the lever to move the bolt 19 against its biasing. A pin is provided for locating into two aligned holes provided, one in each of the two webs 11. The aligned holes are provided having a mutual axis just above the

lever whereby when the pin is located with the lever therebelow, the bolt is held in an open position against its biasing. To release the lever, the pin is removed and the bolt moves to a closed position under its biasing.

**WHAT WE CLAIM IS:—**

1. A hitching device for use in pairs, each for an arm of a traction unit of the type stated, said device comprising an elongate support mountable on end from each opposite face of which first and second mounting means respectively extend, the first mounting means having two mountings spaced longitudinally of the support and adapted for connection to the outer ends of the two members on the arm of the traction unit, and the second mounting means having two catches spaced longitudinally of the support and for connection with mountings provided on an implement, a first catch for each device being located uppermost when the support is on end relative to the second catch and formed by a hook having its entry opening upwardly in said position, and the second catch being formed by a block having an open-ended slot having its entry facing forwardly, the slot being closable by a locking bolt slidably engaged in said block and acting downwardly to close off the entry to said slot.
2. A hitching device as claimed in claim 1 braced to another such device to form a hitching apparatus.
3. A hitching device as claimed in claim 1 or 2 wherein the block is of U-shape fixed through its web to the support with one limb above the other and the slot defined therebetween, the upper limb having at its outer end an upward extension parallel to the support and through which extension and longitudinally thereof a bore is provided in which the locking bolt slides.
4. A hitching device as claimed in claim 2, wherein the bore is continued beyond the open-end of the slot partially into the lower limb to form a keeper for the bolt.
5. A hitching device as claimed in claims 1, 2, 3 or 4, wherein the bolt is moved into and out of a closable position by means of a handle-operated cranked lever.
6. A hitching device as claimed in claim 5, wherein the handle is removable and the bolt is spring-biased to a closed position in the keeper, the handle being used to operate the bolt to open the slot.
7. A hitching device as claimed in claim 6, wherein a pin is provided for locating into two aligned holes provided in the first mounting means to hold said bolt open against its biasing.
8. A hitching device for use in pairs substantially as hereinbefore described with reference to Figs. 1 and 2, or Figs. 1 and 3 of the accompanying drawings.

9. A hitching apparatus formed by two hitching devices braced together substantially as hereinbefore described with reference to Figs. 1 and 2 of the accompanying drawings.

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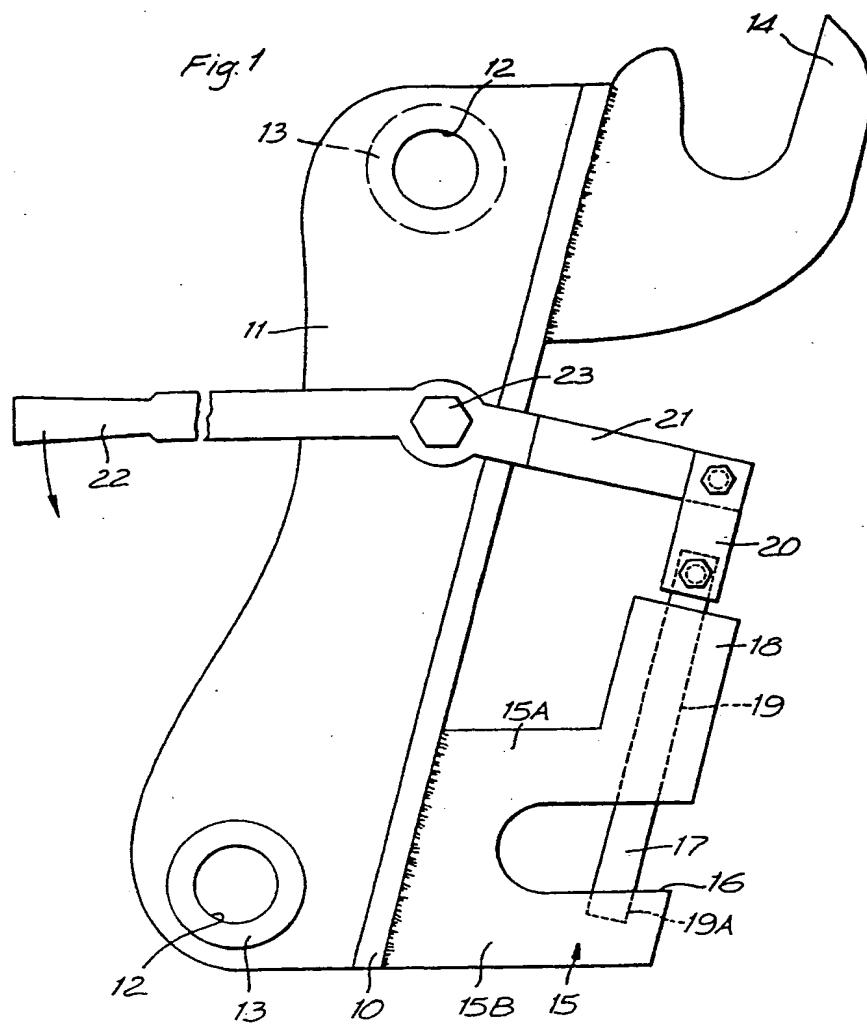
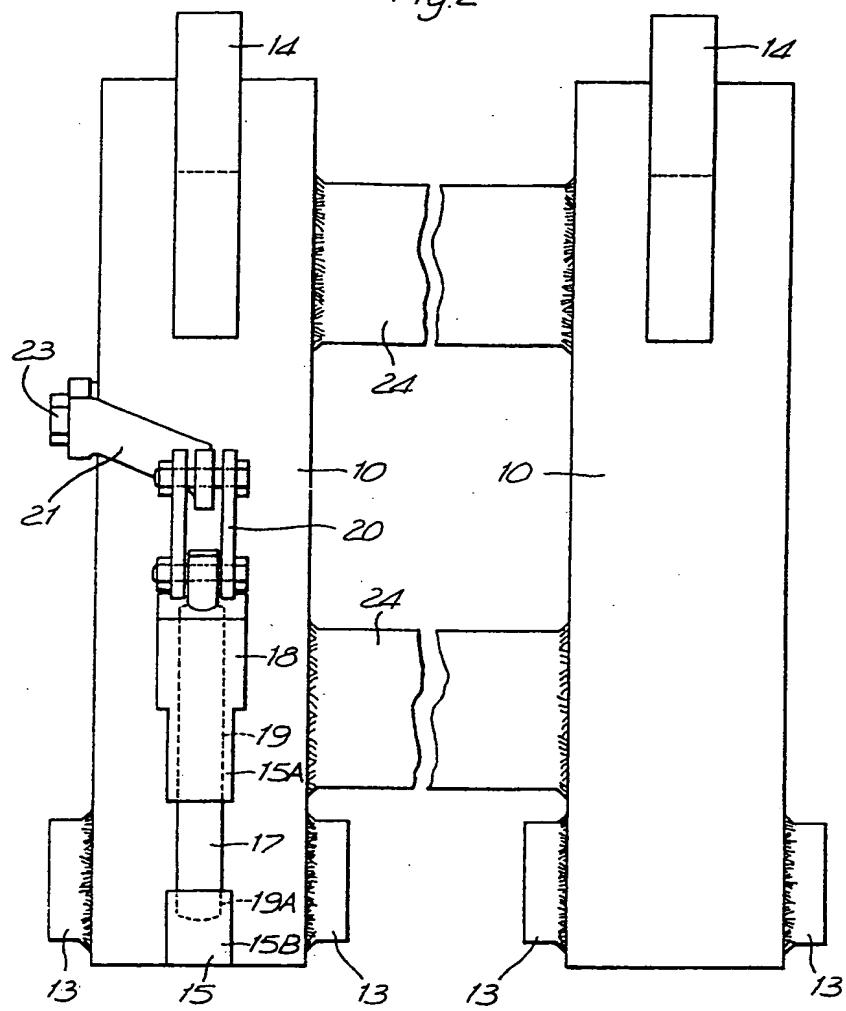


Fig. 2



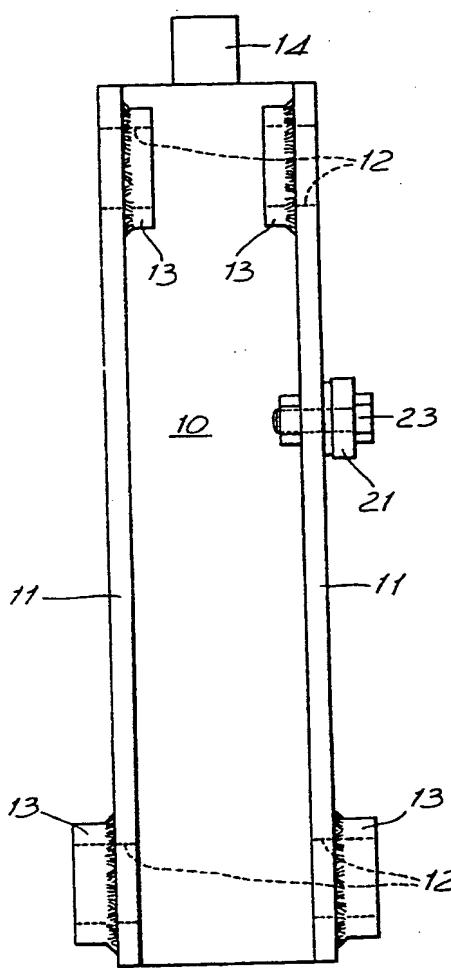
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COMPLETE SPECIFICATION

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Sheet 3

Fig. 3



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